

# AUTOMATIC RETURN DIRECT DRIVE STEREO TURNTABLE SYSTEM

MODEL No. **AP-2400H,E,K,G**

# AIWA®

## [SERVICE MANUAL]



Code No., 07-240-000-53

DATE OF ISSUE 5/1979

### SPECIFICATIONS

<b>Type:</b>	Direct drive stereo turntable system	<b>Signal to noise ratio:</b>	more than 65 dB (DIN B curve)
<b>Semiconductors:</b>	11C, 9 transistors, 5 diodes	<b>(Weighted)</b>	
<b>Power source:</b>	H model AC 120V/220V/240V switchable 50/60Hz	<b>&lt;Tonearm section&gt;</b>	
	E model AC 220V 50/60Hz	<b>Type:</b>	Static balance, straight type
	K,G model AC240V 50/60Hz	<b>Effective length:</b>	222 mm
<b>Power consumption:</b>	3.5W	<b>Overhang:</b>	16.8 mm
<b>Dimensions:</b>	450(W) x 140(H) x 394(D) mm	<b>Tracking error:</b>	+2.5°
<b>Weight:</b>	8.4 kg		-1.3°
<b>Accessories:</b>	Headshell (with cartridge) (H1, E1, K1, G1 model only)	<b>Offset angle:</b>	23.7°
	Spare headshell (H1, E1, K1, G1 model x 1, E model x 2)	<b>Applicable tracking force:</b>	0 to 2.5 g
	EP adapter	<b>Suitable cartridge weight:</b>	6 to 10 g (without spacer) 3.6 to 6 g (with spacer)
	Syncrate cord	<b>&lt;Cartridge section&gt;</b>	[H1, E1, K1, G1 model only]
	Screwdriver	<b>Type:</b>	Moving Magnet (MM)
	Lubricating oil	<b>Output:</b>	1.8 to 3.2 mV
	Stylus position gauge	<b>Separation:</b>	more than 20 dB (33-1/3 rpm, 1 kHz)
<b>&lt;Turntable section&gt;</b>		<b>Tracking pressure:</b>	2 g
<b>Drive system:</b>	Direct drive	<b>Tracking pressure variable range:</b>	0 to 2.5 g
<b>Drive motor:</b>	20-pole 30 slot DC servo direct drive motor	<b>Frequency response:</b>	20 Hz to 20,000 Hz
<b>Speeds:</b>	33-1/3, 45 rpm	<b>Compliance:</b>	15 x 10 <sup>-6</sup> cm/dyne
<b>Fine speed adjustment:</b>	more than ±2.8%	<b>Load impedance:</b>	50 kohms
<b>Platter:</b>	Aluminum diecast Diameter 320 mm	<b>Stylus:</b>	0.5 mil, diamond
<b>Wow &amp; flutter:</b>	less than 0.028% (WRMS) less than 0.05% (DIN)		

- The specifications and external appearance of this set are subject to change without prior notice.

*Proceed with the following adjustments when parts have been replaced. (If any of the parts listed below have been removed in order to replace other parts, re-adjustment is required.)*

### 1. Tonearm replacement

- 1) Adjust the return position.
- 2) Adjust the stylus descent position with auto start.

#### \* Removing the tonearm

- 1) Disconnect the leads with a soldering iron, loosen the countersunk hexagonal screw and remove the fixed plate assembly.
- 2) Remove the hexagonal nut.  
(Refer to Fig. 1)

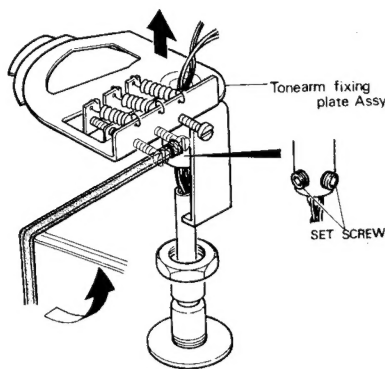


Fig. 1

### 2. Motor replacement

- 1) Adjust the clearance between ratchet A and the platter gear.
- 2) Roughly adjust the rotation speed (using the semi-fixed VRs at the motor side).

### 3. Drive gear replacement

- 1) Adjust the clearance between ratchet A and the platter gear.

### 4. Cartridge replacement

- 1) It is necessary to adjust the stylus height only when the height of the cartridge is markedly different from the height of the accessory cartridge.

### 5. Syncrate microswitch replacement

- 1) Adjust the syncrate timing.

### 6. Arm support replacement

- 1) Adjust the stylus height (with auto, manual modes).

### 7. Slide pitch control replacement

- 1) Check the rotation speed.
- 2) Adjust the speed.

## ADJUSTMENTS

### 1. Stylus height adjustment

#### 1) With auto return operation

Disconnect the plug from the power outlet, switch the power off, set the cueing lever to DOWN and depress the START/REJECT button.

First, rotate the turntable platter by hand until the lead-in function brings the tonearm to the record. If it stops rotating before the tonearm descends onto the record, check the height of the stylus from the surface of the record.

If the stylus height is less than 5 mm, rotate adjust screw A to the right (this increases the height).

If the stylus height is more than 8 mm, rotate adjust screw A to the left (this reduces the height).  
(Refer to Fig. 2)

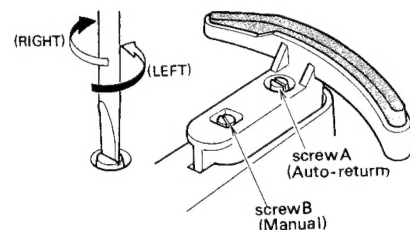


Fig. 2

#### 2) With manual operation

Disconnect the plug, switch the power off, depress the START/REJECT button, and rotate the platter by hand until the stylus has descended onto the record for play. Now check the stylus height when the cueing lever is set to UP.

If the stylus height is less than 5 mm, rotate the adjust screw B to the right to increase the height.

If the stylus height is more than 8 mm, rotate the adjust screw B to the left and reduce the height.  
(Refer to Fig. 2)

### 2. Return position adjustment

- 1) Check whether the fixed plate assembly is mounted parallel to the tonearm.

**Note:** It is not necessary to follow step 1) when adjusting the return position but care should be taken especially when the fixed plate assembly is replaced.

- 2) Place a record on the platter, lower the stylus to a position about 65 to 75 mm from the center of the platter, and check whether the tonearm returns automatically to the position below when the platter rotates and the stylus approaches the lead-out groove on the record.

#### (1) Using an LP

If the stylus comes to a position 53 to 57.5 mm (between final sound groove and lead-out groove) from the center of the platter, the sound of ratchet interlocking should be heard and the tonearm should return to the arm rest.

- (2) Using an EP  
If the stylus comes to a position 48.5 to 53 mm (between the final sound groove and lead-out groove) from the center of the platter, the sound of the ratchet interlocking should be heard and the tone-arm should return to the arm rest.

Adjust as follows if the tonearm does not return at the above positions.

- (1) Remove the blind seal at the rear of the bottom cabinet side.
- (2) Check that the tonearm is anchored to the arm rest.
- (3) Rotate return adjust screw (A) and adjust as follows.  
If the return action comes too late:  
Rotate adjust screw (A) to the left (this distances the return position from the platter center and speeds up the return operation).  
If the return action comes too early:  
Rotate adjust screw (A) to the right (this brings the return position closer to the platter center and slows down the return operation).  
(Refer to Fig. 3)

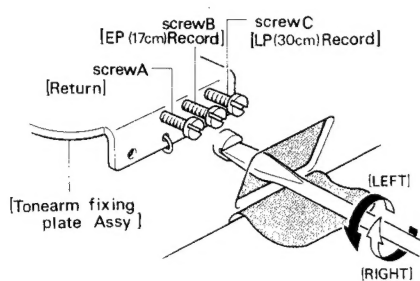


Fig. 3

### 3. Stylus descent position adjustment with auto start

- 1) If the start of the track is cut out or the stylus is disengaged from the record in the auto start mode, adjust as follows.
  - (1) If the start of the track is cut out:  
Rotate the adjust screw to the left.
  - (2) If the stylus is disengaged from the record:  
Rotate the adjust screw to the right.

**Note:** When adjust screws B and C (B for singles and EPs and C for LPs) are rotated to the left, the stylus moves away from the center of the platter (to the outside) and when the screws are rotated to the right, the stylus moves toward the center (to the inside).  
Perform this adjustment with the power switched on and a record played, and paint-lock the screw after adjustment.  
(Refer to Fig. 3)

### 4. Speed adjustment

Set the pitch control knob to the center and if the stroboscope pattern appears to move at the 33 rpm or 45 rpm speed, adjust again the rough adjust VR on the motor.

- (1) Set the pitch control to the center position.
- (2) Remove the rough adjust label on the bottom of the cabinet.
- (3) Switch on the power and use a screwdriver to adjust the semi-fixed VRs (VR33, 45) so that the stroboscope patterns appears to stand still while the platter is rotating at 33 or 45 rpm.  
If the pattern moves to the right, make the platter rotate more quickly.

If the pattern moves to the right, make the platter move more slowly.  
(Refer to Fig. 4)

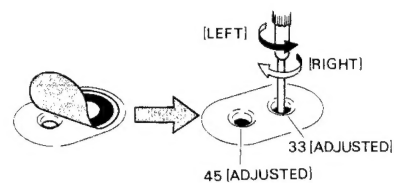


Fig. 4

### 5. Ratchet A and platter clearance adjustment

- 1) Check that the clearance between ratchet A and the platter is 0.4 to 0.6 mm.
- 2) If the clearance is more or less than this value, rotate the drive gear pin and adjust.  
(Refer to Fig. 5)

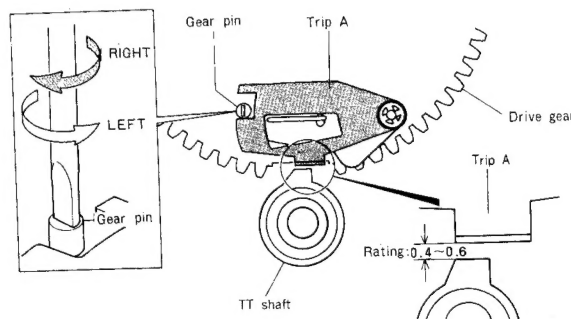


Fig. 5

### 6. Syncrate adjustment

If the syncrate timing is out of sync, proceed with the adjustment outlined below.

**Note:** Perform the syncrate adjustment after the stylus height adjustment.

If the syncrate timing is too slow, rotate the adjust screw to the left.  
(Refer to Fig. 6)

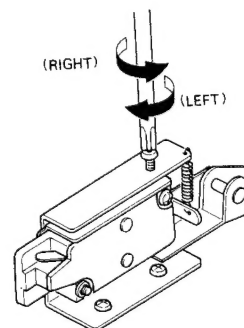
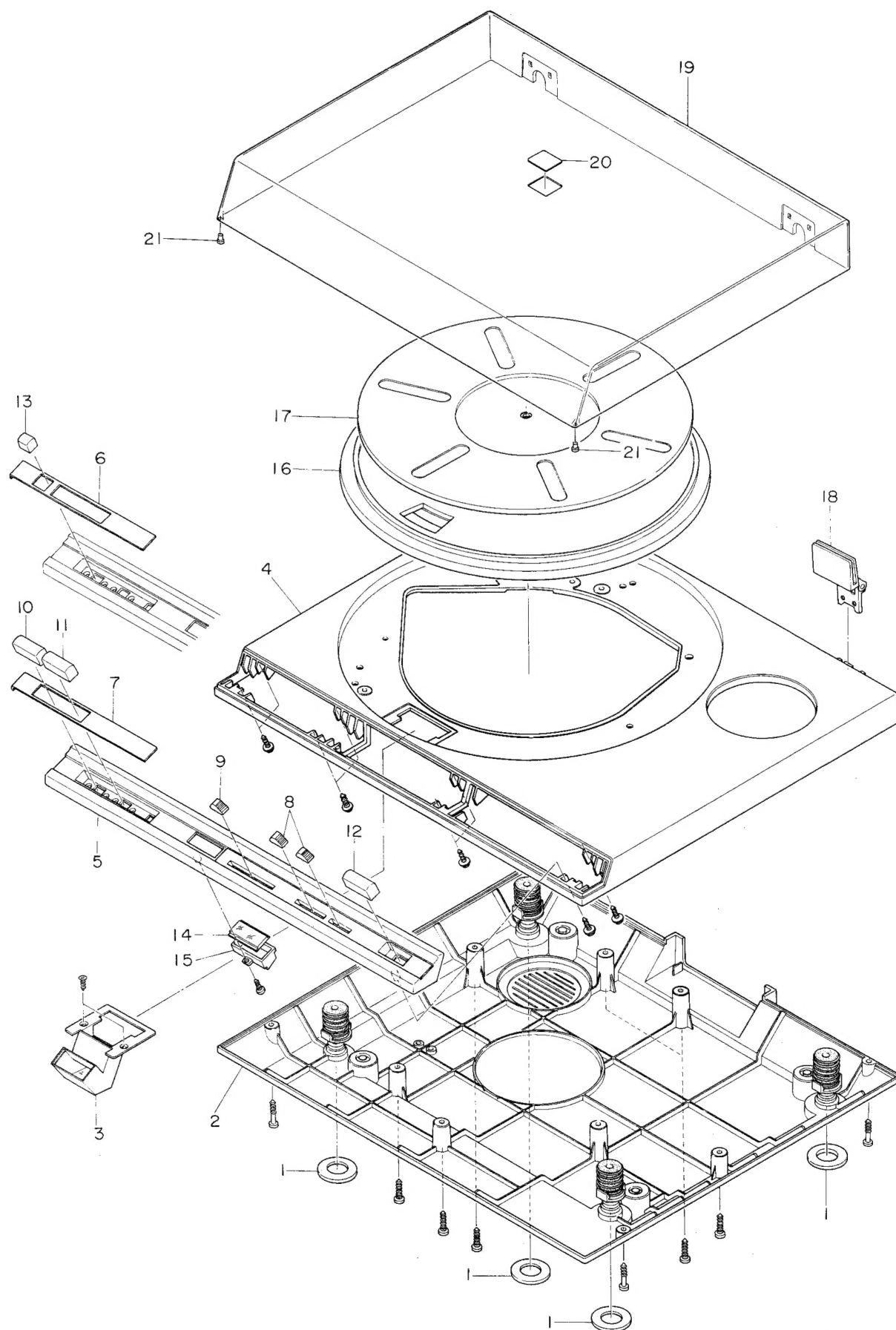


Fig. 6

EXPLODED VIEW-1

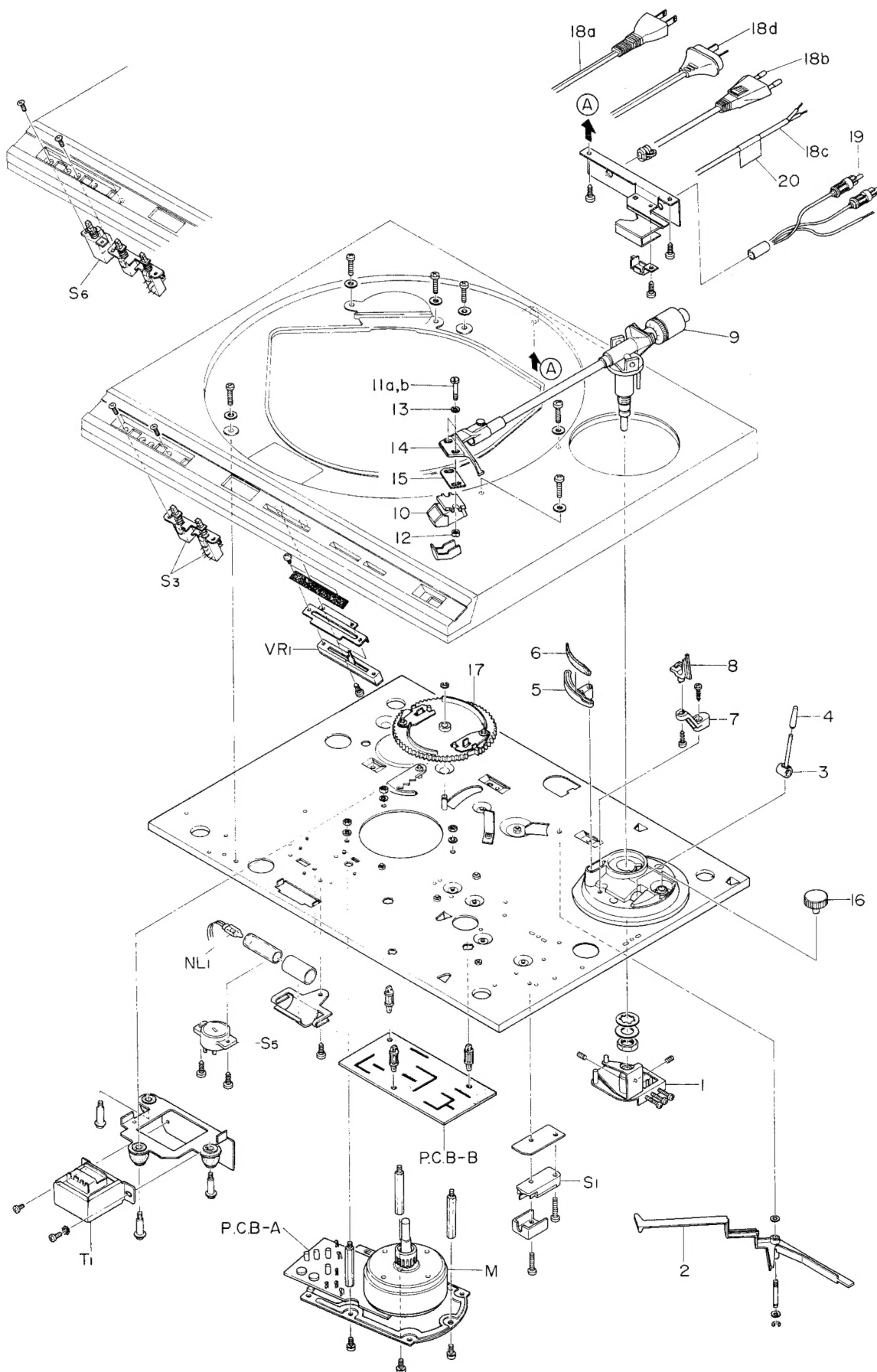


## PARTS LIST

## MECHANICAL PARTS

Ref. No.	Part No.	Part No. Changed to	Description	Q'ty
1-1	84-115-350-01		Felt, Leg	4
1-2	84-115-016-01		Bottom cabinet	1
1-3	84-115-273-01		Neon hood ass'y	1
1-4	84-115-017-01		Cabinet, Top	1
1-5	84-115-001-01		Panel, Front	1
1-6	84-115-003-01		Fram A (K model only)	1
1-7	84-115-004-01		Fram B	1
1-8	84-115-011-01		Slide knob	2
1-9	84-115-012-01		Pitch control	1
1-10	84-115-007-01		Speed selector button	1
1-11	84-115-006-01		Speed selector button	1
1-12	84-115-002-01		Control button, SR	1
1-13	84-115-009-01		Button, POWER (K model only)	
1-14	84-115-361-01		Acryl plate	1
1-15	84-115-362-01		Holder, Acryl plate	1
1-16	84-115-384-01		Turntable	1
1-17	84-115-385-01		Sheet, Turntable	1
1-18	84-115-390-01		Hinge	2
1-19	84-115-351-01		Lid	1
1-20	84-115-353-01		Name plate, Lid	1
1-21	84-115-352-01		Cushion, Lid	2

EXPLODED VIEW-2



Ref. No.	Part No.	Part No. Changed to	Description	Q'ty
2-1	84-115-277-01		Holder plate, PU ass'y	1
2-2	84-115-294-01		Arm return	1
2-3	84-115-327-01		Cueing lever	1
2-4	84-115-329-01		Knob, Cueing	1
2-5	84-115-331-01		Arm support	1
2-6	84-115-210-01		Rubber, Arm support	1
2-7	84-115-336-01		Rest, Arm	1
2-8	84-115-337-01		Arm rest ass'y	1
2-9	84-115-316-01		Tonearm ass'y	1
2-10	84-190-962-01		Cartridge	1
2-11a	84-115-386-01		Screw, Cartridge stopper	4
2-11b	84-115-389-01		Screw, Cartridge stopper	2
2-12	84-115-387-01		Nut, M2.6	4
2-13	84-115-388-01		Washer, Cartridge stopper	6
2-14	84-115-317-01		Head shell	1
2-15	84-115-318-01		Head weight	2
2-16	84-115-320-01		Knob, IFC	1
2-17	84-115-211-01		Drive gear ass'y	1
2-18a	84-115-664-01		AC power cord (H model only)	1
2-18b	84-115-661-01		AC power cord (E model only)	1
2-18c	84-115-662-01		AC power cord (K model only)	1
2-18d	84-115-663-01		AC power cord (G model only)	1
2-19	84-115-665-01		Cord, Output	1
2-20	87-056-008-01		Label, AC power cord (K model only)	1

**ACCESSORIES/PACKAGE**

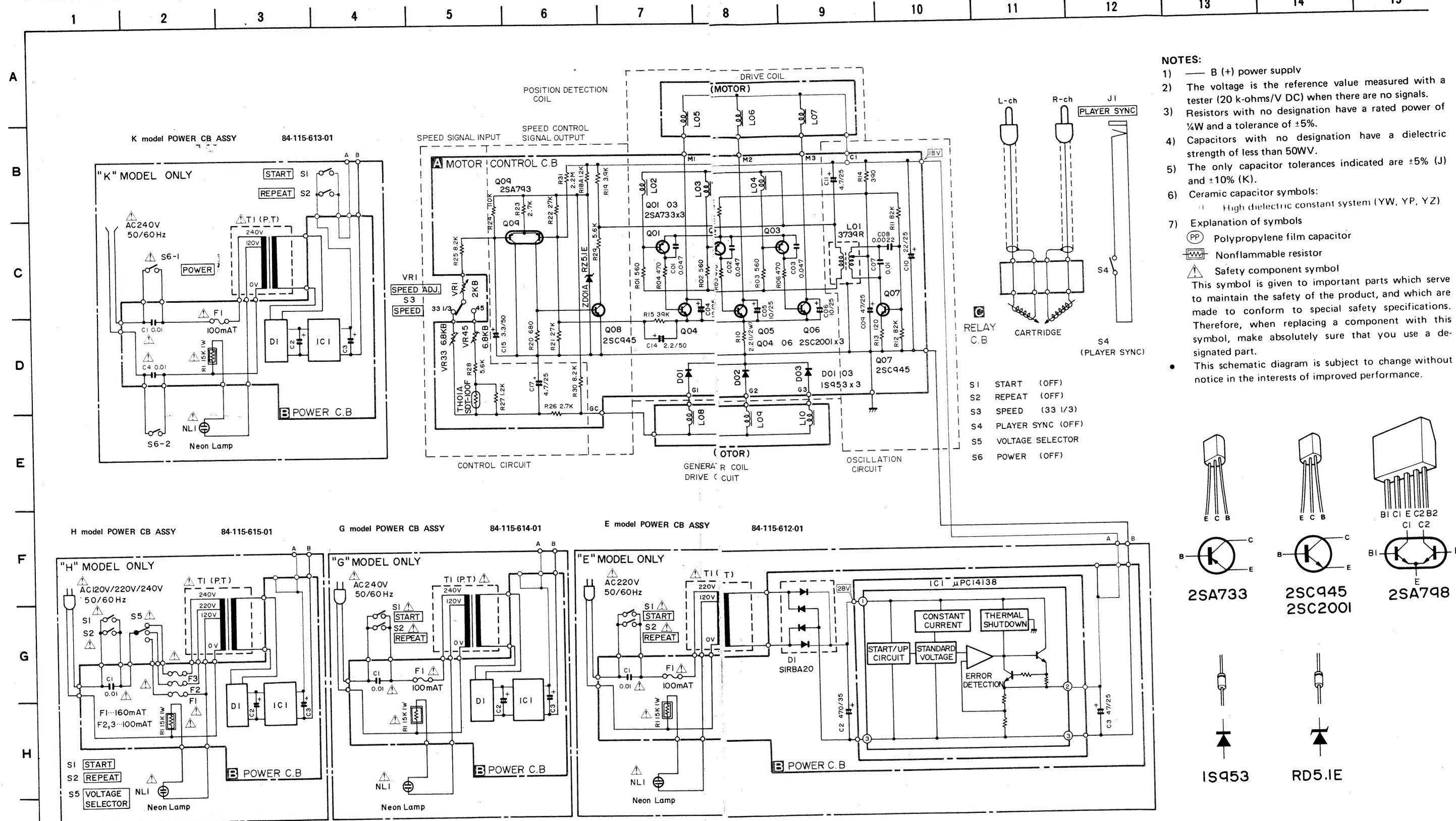
Ref. No.	Part No.	Part No. Changed to	Description	Q'ty
1	84-115-851-01		Printed indiv., Packing	1
2	84-115-852-01		Cushion L, Printed indiv.	1
3	84-115-853-01		Cushion R, Printed indiv.	1
4	84-115-854-01		Cushion, Auxiliary	1
5	84-115-855-01		Cover, Auxiliary	1
6	84-115-856-01		Sheet, Foamed mat	2
7	84-115-857-01		Poly-vinyl sack (for case)	1
8	84-115-858-01		Poly-vinyl sack (for dust cover)	1
9	84-115-859-01		Poly-vinyl sack (for turntable)	1
10a	84-115-904-01		Instructions booklet (H, E model only)	1
10b	84-115-905-01		Instructions booklet (K, G model only)	1
11	87-056-009-41		Distributors list	1
12	87-056-008-11		Label, AC power cord (K model only)	1
13	87-056-032-01		Cuarantea card (G model only)	1
14	84-115-861-01		Curly stopper	2

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**AIWACO.,LTD.**



## SCHEMATIC DIAGRAM



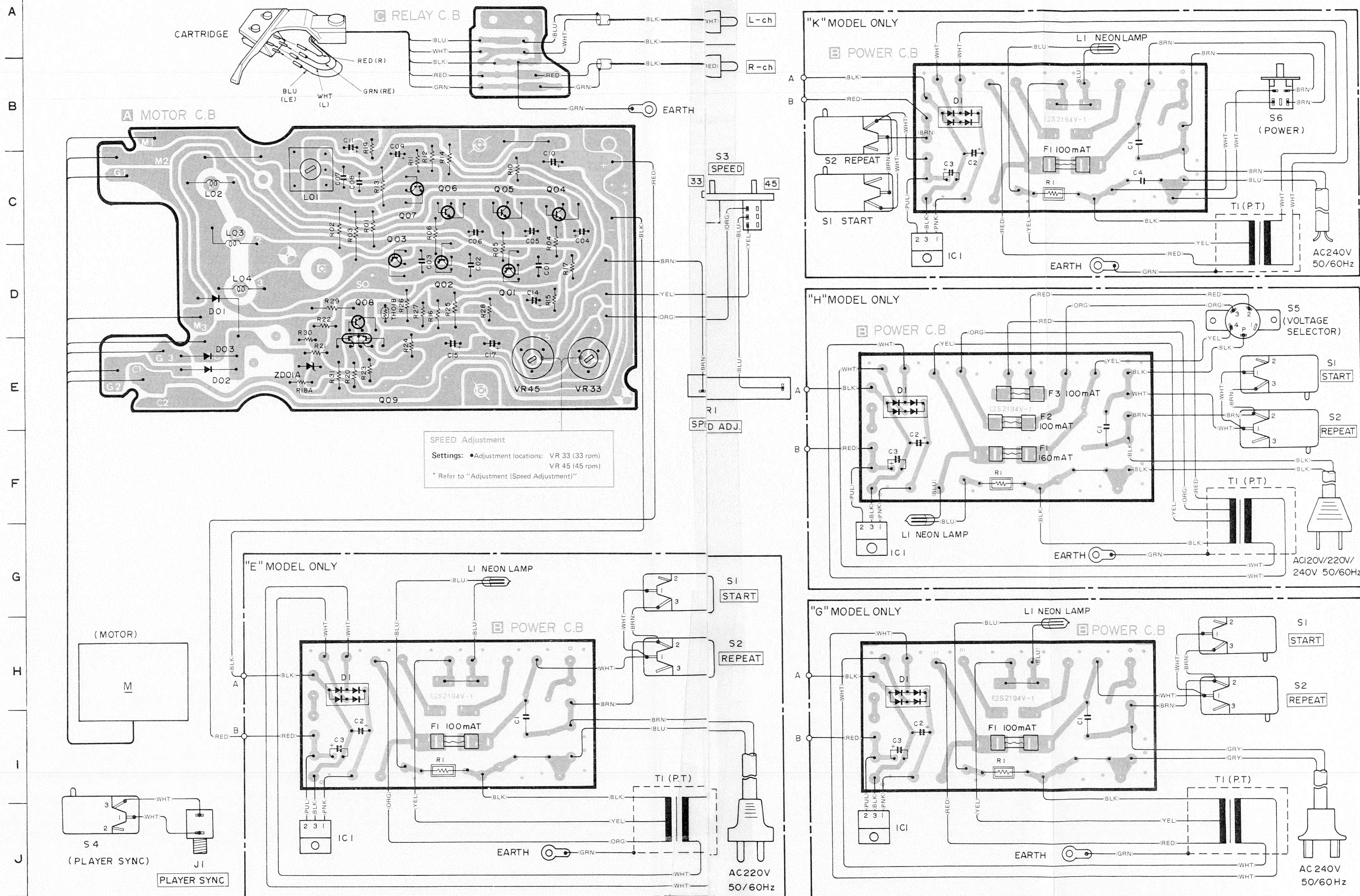
### BLOCK DIAGRAM

**⚠** This symbol is given to important parts which serve to maintain the safety of the product, and which are made to conform to special safety specifications. Therefore, when replacing a component with this symbol, make absolutely sure that you use a designated part.



WIRING

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15



- NOTES (1)  B(+) Pattern  Others pattern
- (2) The voltage is the reference value measured with a tester (20 K ohms/V D<sub>1</sub>) when there are no signals.